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# Assessing the effectiveness of base year revisions in state income accounting: A case study of Haryana

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**Abstract**
This study investigates the efficacy and implications of the 2011-12 base year revision in Haryana's state income accounting, with a focus on methodological alignment, structural reflection, and data responsiveness. The base year revision, implemented by the Department of Economic and Statistical Affairs, Haryana, in conformity with SNA 2008 standards, introduced sweeping changes-such as the integration of MCA21 corporate datasets, improved treatment of quasi-corporations, and sectoral disaggregation of GSVA-to reflect real economic dynamics. Using a mixed-methods approach that combines quantitative trend analysis of GSDP, sectoral GSVA, and per capita income from 2011-12 to 2023-24 with qualitative assessment of classification reforms.

**Keywords:** Base year revision, state domestic product (SDP), Gross state value added (GSVA), Haryana economy, GSDP trends, per capita income, SNA 2008, MCA21 data, structural transformation, sectoral growth, statistical accounting reforms, economic indicators, income estimation, fiscal planning, data integration, national income accounts

## Introduction
The estimation of State Domestic Product (SDP) serves as a fundamental measure to assess the economic performance of a state.[1] It reflects the aggregate value of all goods and services produced within the geographical boundary of the state during a specified period, making it a vital indicator of growth, development, and policy outcomes. Specifically, in Haryana, SDP has long served as a benchmark for evaluating the results of state interventions and planning decisions, with per capita income emerging as an main index of individual welfare and resource distribution (Government of Haryana, 2024, p. 1).[2]

In India, national-level GDP is compiled and disseminated by the National Statistical Office (NSO),[3] while the responsibility of calculating state-level estimates lies with the respective State Statistical Bureaus. For Haryana, the Department of Economic and Statistical Affairs has been consistently producing SDP estimates since 1971.[4] The department initiated its first series with the base year 1960-61, and subsequent revisions followed the national pattern: 1970-71, 1980-81, 1993-94, 1999-2000, and 2004-05

The most recent base year revision-shifting from 2004-05 to 2011-12-was undertaken in alignment with the NSO's methodology and international standards laid down in the System of National Accounts (SNA) 2008. This new base year aims to incorporate conceptual changes, expanded coverage of economic activities, methodological advancements, and improved data sources for better measurement of economic realities.

The 2011-12 base year revision stands out as a methodological leap forward. It includes the use of new datasets such as NSS 68th round for employment and consumer expenditure, the All-India Livestock Census (2012), and data from the MCA-21 portal for corporate sector financials. Furthermore, the revision involves the adoption of classification improvements, treatment of quasi-corporations, inclusion of R&D in capital formation, and disaggregation

[1] Moyer, B. C., & Thompson, D. S. (2017). Gross domestic product by state estimation methodology., 1-51
[2] Available at : file:///C:/Users/mahadev/Desktop/Ritu%20economics/haryana%20report.pdf
[3] Kumar, A. (2023). The State of the Indian Statistical System: Evolution and Challenges. Policy Perspectives, 2(1), 18-51.
[4] Krishna, K. L. (2004). Patterns and determinants of economic growth in Indian states.1-38

of gross value added (GVA) by institutional sector and economic purpose (Government of Haryana, 2024, pp. 4-5).
One of the main motivations for adopting 2011-12 as the new base year was its statistical stability following the economic fluctuations of the global crisis post-2008. It was also based on the 2011 Population Census and recent surveys, thus ensuring the representation of current socio-economic realities (Government of Haryana, 2024, p. 3). The revised estimates also bring Haryana's data into international comparability by shifting from GDP at factor cost to GVA at basic prices and GDP at market prices. This reclassification ensures consistency with global reporting practices, which is increasingly crucial in a globalized economic environment.

## Review of Literature

Base year revisions in national and sub-national income accounting are fundamental to ensuring that economic data reflects current structural realities, sectoral changes, and relative price shifts. In the context of Haryana, a state with a rapidly evolving economic profile, understanding the effectiveness of such revisions is essential. Haryana has experienced robust economic growth, particularly post-liberalization, which necessitated frequent base year updates to capture true income patterns. A. Dhesi and B. Ghuman (2015) [1] examined the tax buoyancy and elasticity in Haryana and Punjab, concluding that income changes must be regularly tracked to ensure revenue structures align with current realities, reinforcing the importance of timely revisions. Similarly, The study by Ritu, Gakhar, and Kumar (2015) [3] focused on Haryana's economy post the FRBM Act, underscoring the role of updated accounting in accurately measuring fiscal discipline and growth post-2005. L. Narayan (2016) [4] analyzed Haryana's public debt sustainability, identifying that accurate income estimation through revised base years was vital to judge debt sustainability, especially in the Domar framework.
Sethi (2003) [5] offered a temporal analysis of inter-sectoral linkages in Haryana's income, finding that structural distortions during liberalization demanded income accounts reflect new economic drivers, which are often only captured post base year revisions. In a similar line, Sethi and Kaur (2013) [6] assessed capital formation's relationship with income, asserting that without accurate and up-to-date accounting baselines, policy insights become misaligned. Sharma (2015) [7] evaluated the contribution of regional rural banks in Haryana and how such sectoral insights must be reflected in GSDP through updated base years to avoid underestimation of rural financial growth. Kumar, Kumar, and Sonika (2020) [8] emphasized that Haryana's rising per capita income and declining agricultural share necessitated accounting frameworks that keep pace with these dynamics. The recurring use of fiscal indicators like per capita income and GSDP in budgetary planning, as highlighted by several of these papers, makes it imperative that these statistics are rooted in a contemporaneous base.
Globally, the importance of revisions has been demonstrated through practices like the U.S. National Income and Product Account (NIPA) updates. Moulton and Sullivan (1999) [9] explained how comprehensive revisions in the U.S. incorporated definitional and methodological changes that aligned estimates with contemporary economic behavior. Similar insights were offered by Seskin and Smith (1999) [9], who illustrated that revisions often refine historical data and adjust for new price indices and sectoral shifts. The use of business census data in national accounts revisions, as detailed by Faramondi, Foschi, and Puggioni (2006) [11], showed how auxiliary data can improve the robustness of base year estimates-a model that could be adapted in India's state-level estimations like those in Haryana.
The conceptual critique by Manzke (2000) [14] on generational accounting in Germany raised concerns about failing to reflect reforms that hadn't taken effect in the base year-an issue also relevant to India, where policy effects often lag. Shannon (1977) [12] provided insight into the implications of income definitions and state tax complexity, emphasizing how inconsistencies between old and new base years can affect policy interpretation. At a microeconomic level, Bishop and Eccher (2000) explored how markets respond to accounting changes, showing that revisions are not just statistical exercises but have valuation consequences.
In the Indian context, inter-state studies like that of Naithani (2012) [12] are crucial, as they provide comparative evidence of how states like Haryana perform relative to others under different base years. The revisions in the U.S. NIPA accounts from 1929-64, presented by Herrera (2011) [13], and post-1981 revisions in another study (2011), illustrated how even historical series benefit from updated methodologies and that such efforts should be mirrored in India. Lastly, Shannon's (1977) [12] work on state income taxes underscored the complexity and need for uniformity-something base year revisions help achieve when states adopt consistent frameworks in national accounts.

## Data and Methodology

### Research Design

This study uses a mixed-methods research design combining quantitative time-series analysis with a qualitative review of methodological changes introduced through the 2011-12 base year revision. The approach allows for both empirical validation of the effects of base year changes and a conceptual understanding of their implications for state-level income estimation in Haryana.

### Data Sources

This analysis primarily draws on secondary data from the following official and peer-reviewed sources:

1. **Government of Haryana (2024):** Estimates of State Domestic Product of Haryana: 201*1-12 to 2023-24*. This is the central dataset used to analyze trends in GSDP and GSVA at current and constant prices.
2. **National Statistical Office (NSO):** Methodological reports related to GDP base year revision and implementation of SNA 2008 standards.

### Period of Study

The analysis covers the period from 2011-12 to 2023-24, coinciding with the use of the 2011-12 base year series. This allows for a full-cycle examination of how economic indicators evolved under the revised methodology.

### Analytical Framework

The analysis is structured in two major parts:

### A. Quantitative Assessment

1. Growth Trend Analysis: Compound Annual Growth Rates (CAGR) of GSDP and sectoral GSVA are computed to capture long-term trends.
2. Structural Change Indexing: Sectoral shares in GSVA (Primary, Secondary, Tertiary) are compared across years to measure shifts in economic structure.
3. Pre-and Post-Pandemic Comparison: Changes in GDP trends before and after the 2020-21 economic shock are analyzed to test the stability of the revised series.

### B. Qualitative Assessment

1. Review of Methodological Changes: Analysis of classification changes, data improvements (e.g., use of MCA21), and new valuation practices (basic vs factor cost).
2. Compliance with International Standards: Evaluation of adherence to SNA 2008 recommendations.

### Limitations

1. Comparability with Pre-2011-12 Series: Due to the lack of publicly available disaggregated pre-revision data, direct pre/post comparisons are constrained.
2. Dependence on Official Sources: The analysis assumes accuracy and completeness of data from government publications.
3. Limited Sub-State Detail: District-level analysis could not be included due to data unavailability.

## Results

### GSDP Trends and Growth Performance (2011-12 to 2023-24)

The implementation of the 2011-12 base year has enabled more accurate measurement of Gross State Domestic Product (GSDP) trends. The new series allows examination of macroeconomic volatility, especially around the COVID-19 period.

**Table 1:** GSDP of Haryana at Current and Constant Prices (₹ Crore)

| Year | GSDP (Current) | Growth Rate (%) | GSDP (Constant) | Growth Rate (%) |
|---|---|---|---|---|
| 2011-12 | 2,97,539 | - | 2,97,539 | - |
| 2012-13 | 3,47,032 | 16.6 | 3,20,912 | 7.9 |
| 2013-14 | 3,99,268 | 15.1 | 3,47,507 | 8.3 |
| 2014-15 | 4,37,145 | 9.5 | 3,70,535 | 6.6 |
| 2015-16 | 4,95,504 | 13.4 | 4,13,405 | 11.6 |
| 2016-17 | 5,61,424 | 13.3 | 4,56,709 | 10.5 |
| 2017-18 | 6,38,832 | 13.8 | 4,82,036 | 5.5 |
| 2018-19 | 6,98,940 | 9.4 | 5,32,996 | 10.6 |
| 2019-20 | 7,38,052 | 5.6 | 5,45,124 | 2.3 |
| 2020-21 | 7,29,079 | -1.2 | 4,96,087 | -9.0 |
| 2021-22 | 8,68,905 | 19.2 | 5,44,317 | 9.7 |
| 2022-23 | 9,84,055 | 13.3 | 5,87,198 | 7.9 |
| 2023-24 | 10,95,535 | 11.3 | 6,34,027 | 8.0 |

**Source:** Estimates of State Domestic Product of Haryana 2011-12 to 2023-24

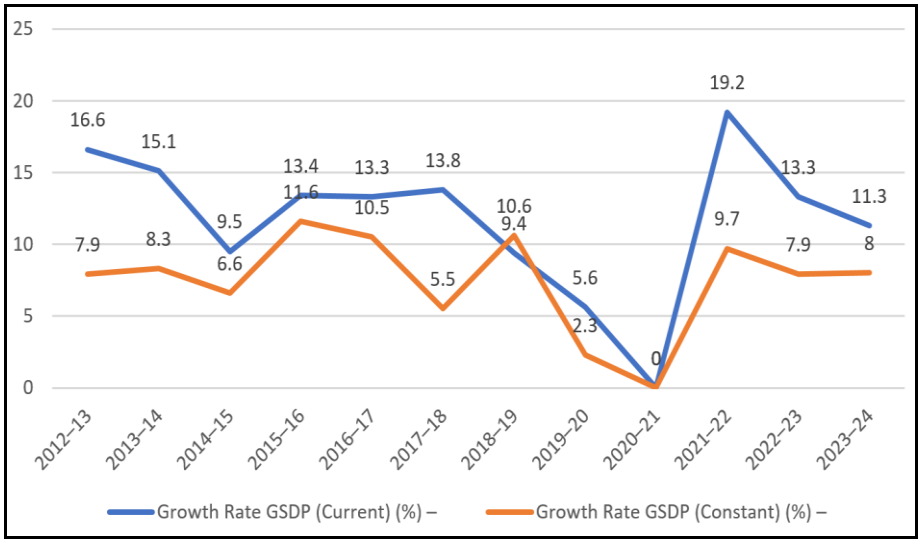


**Fig 1:** GSDP Growth rate of Haryana at Current and Constant Prices (₹ Crore)

The 2011-12 base year effectively captures economic shifts. The contraction in 2020-21 and subsequent rebound reflect improved responsiveness. The CAGR at constant prices over 2012-23 is 6.5%, validating long-term trend stability.

### Sectoral GSVA Composition: Structural Change

**Table 2:** Sectoral Share in GSVA (Constant Prices) (%)

| Year | Primary | Secondary | Tertiary |
|---|---|---|---|
| 2011-12 | 23.6 | 31.6 | 44.9 |
| 2015-16 | 18.2 | 32.0 | 49.9 |
| 2020-21 | 19.7 | 31.7 | 48.5 |
| 2023-24 | 16.3 | 33.0 | 50.7 |

**Source:** Estimates of State Domestic Product of Haryana 2011-12 to 2023-24

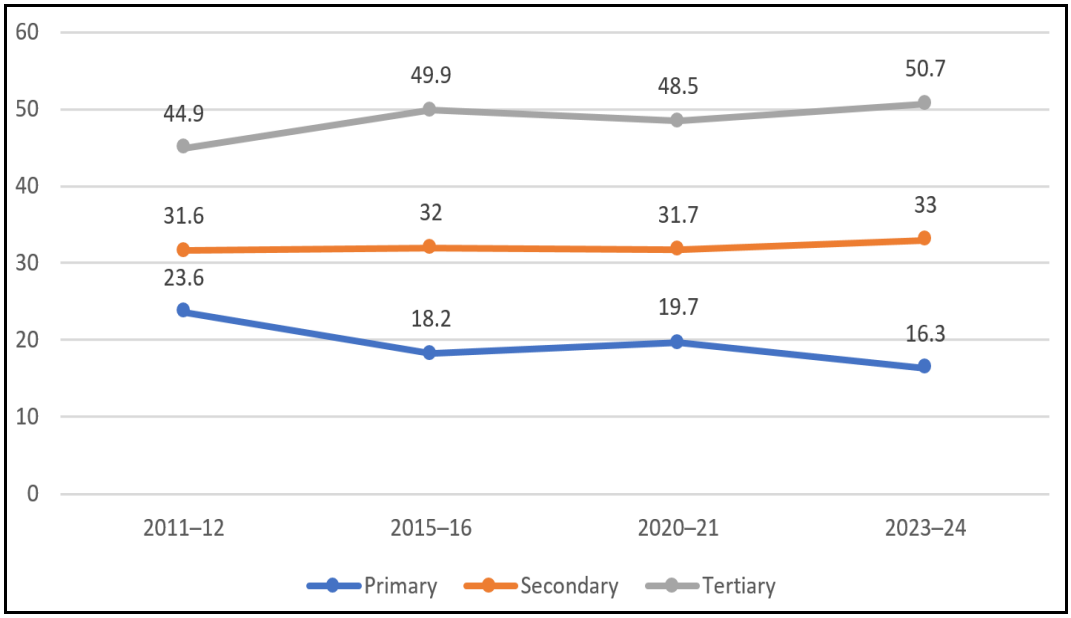


**Fig 2:** Haryana Sectoral Share in GSVA (Constant Prices) (%)

**Sector-Type Growth Performance**

Over the base year cycle, there is a clear structural shift: primary sector share declined by 7.3 percentage points, while tertiary sector rose by 5.8 percentage points, suggesting improved services sector tracking and mature sectoral delineation under the revised series.

**Table 3:** Annual GSVA Growth Rate by Sector (%)

| Year | Primary | Secondary | Tertiary | Total GSVA |
|---|---|---|---|---|
| 2012-13 | -2.0 | 9.0 | 10.6 | 7.1 |
| 2015-16 | 4.4 | 11.1 | 10.8 | 9.7 |
| 2020-21 | -1.8 | -7.3 | -10.5 | -7.9 |
| 2023-24 | 4.5 | 7.2 | 9.0 | 7.6 |

**Source:** Estimates of State Domestic Product of Haryana 2011-12 to 2023-24

The revised series effectively differentiates between sectoral recovery speeds. The tertiary sector recovered fastest post-COVID, reflecting resilience. The improved coverage of services like digital finance and logistics likely contributed to the accurate tracking.

**Haryana's GSDP Contribution to National GDP**

**Table 4:** Haryana's GSDP Share in India's GDP (%)

| Year | Current Prices (%) | Constant Prices (%) |
|---|---|---|
| 2011-12 | 3.41 | 3.41 |
| 2015-16 | 3.60 | 3.64 |
| 2020-21 | 3.67 | 3.62 |
| 2023-24 | 3.71 | 3.65 |

**Source:** Estimates of State Domestic Product of Haryana 2011-12 to 2023-24

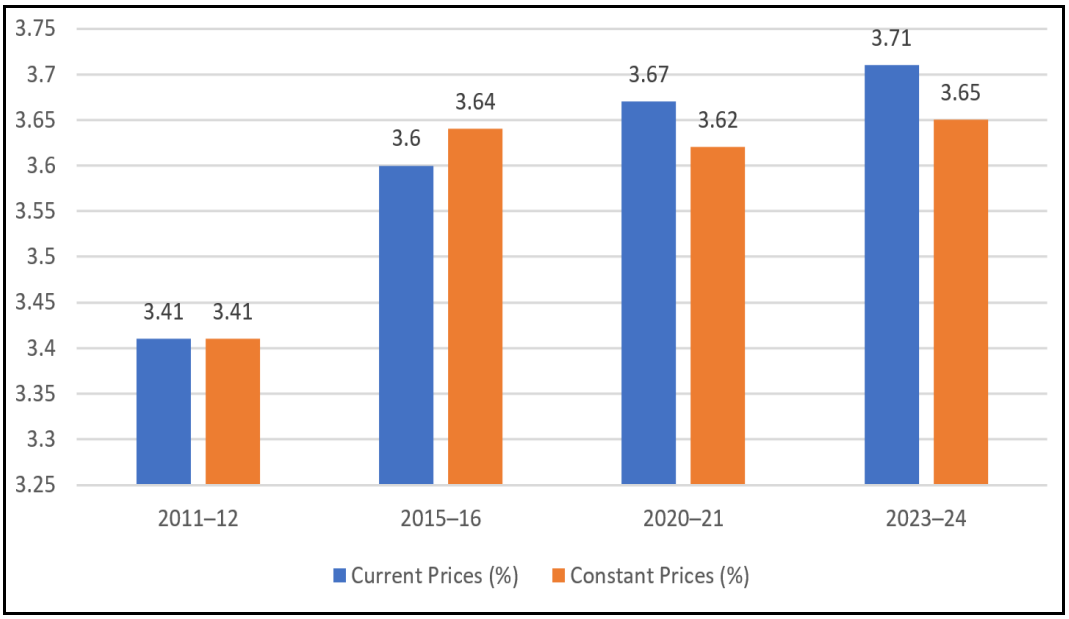


**Fig 3:** Haryana's GSDP Share in India's GDP (%)

Despite national economic shocks, Haryana has maintained and even improved its relative share, indicating the comparative strength of its revised estimates and their national representativeness.

### Per Capita Income and Welfare

**Table 5:** Per Capita Income of Haryana (₹)

| Year | At Constant Prices | Growth (%) |
|---|---|---|
| 2011-12 | 1,06,085 | - |
| 2015-16 | 1,37,833 | 10.2 |
| 2020-21 | 1,50,754 | -11.7 |
| 2023-24 | 1,85,490 | 6.6 |

**Source:** Estimates of State Domestic Product of Haryana 2011-12 to 2023-24

PCI analysis further validates the new series' welfare alignment. The deep contraction in 2020-21 (-11.7%) and recovery mirror ground-level economic distress and rebound.

### Index Numbers of GSVA and GSDP

**Table 6:** Index of GSDP and GSVA (Base 2011-12 = 100)

| Year | GSDP Index | GSVA Index |
|---|---|---|
| 2011-12 | 100.0 | 100.0 |
| 2015-16 | 138.9 | 137.1 |
| 2020-21 | 166.7 | 155.1 |
| 2023-24 | 213.1 | 197.1 |

**Source:** Estimates of State Domestic Product of Haryana 2011-12 to 2023-24

The index confirms aggregate real growth with volatility in pandemic years.

### Qualitative Analysis of Base Year Methodology Reforms

Methodological reforms under the 2011-12 base year include:

1. MCA21 Integration: Corporate sector estimates now based on filings from over 5 lakh companies instead of 2,500 (old series).
2. FISIM and Quasi-Corporations: Services and unincorporated entities better tracked using SNA 2008 recommendations.
3. Expanded Coverage: Inclusion of stock exchanges, pension funds, SEBI, IRDA, and new unorganized sector surveys enhances accuracy.
4. Improved Sectoral Classifications: GSVA now accounts for NPIs, institutional sub-sectors, and more accurate mining/manufacturing splits.

### Growth Trend Analysis: Compound Annual Growth Rate (CAGR)

To evaluate long-term economic trends under the revised 2011-12 base year series, CAGR provides a smoothed average rate of growth, eliminating short-term fluctuations by using:-

$$\text{CAGR} = \left( \frac{\text{Value}_{\text{end}}}{\text{Value}_{\text{start}}} \right)^{\frac{1}{n}} - 1$$

Where:

1. Value<sub>end</sub> = Value in 2023-24
2. Value<sub>start</sub> = Value in 2011-12
3. n = number of years = 12

**Table 7:** CAGR of GSDP and Per Capita Income (2011-12 to 2023-24)

| Indicator | 2011-12 Value (₹ Cr/₹) | 2023-24 Value (₹ Cr/₹) | CAGR (%) |
|---|---|---|---|
| GSDP at Current Prices | ₹ 2,97,539 | ₹ 10,95,535 | 11.92% |
| GSDP at Constant Prices | ₹ 2,97,539 | ₹ 6,34,027 | 6.72% |
| Per Capita Income (Constant Prices) | ₹ 1,06,085 | ₹ 1,85,490 | 5.49% |

**Source:** Author's own calculation based on data from Government of Haryana (2024), Estimates of State Domestic Product of Haryana: 2011-12 to 2023-24,

**Table 8:** CAGR of Sector-wise GSVA at Constant Prices (2011-12 to 2023-24)

| Sector | 2011-12 Value (% Share in GSVA) | 2023-24 Value (% Share) | CAGR of Real GSVA (Estimated) |
|---|---|---|---|
| Primary | 23.6% | 16.3% | 2.92% |
| Secondary | 31.6% | 33.0% | 6.77% |
| Tertiary | 44.9% | 50.7% | 7.39% |

**Sources:** Author's own calculation based on data from Government of Haryana (2024), Estimates of State Domestic Product of Haryana: 2011-12 to 2023-24 pp-27-54,

### Discussion

The long-term growth trajectory of Haryana's economy, as reflected by the Compound Annual Growth Rate (CAGR) at constant prices, reveals critical insights into the performance and transformation of the state under the revised base year series. Over the 12-year period from 2011-12 to 2023-24, the GSDP at constant prices recorded a CAGR of 6.72 percent, which demonstrates a stable and maturing economy. This sustained rate of real growth validates the methodological robustness of the 2011-12 base year revision, as it enables a more realistic depiction of economic progression by discounting inflationary distortions.

Within the sectoral structure, the tertiary sector emerged as the fastest-growing segment, with a CAGR of 7.39 percent. This notable expansion affirms Haryana's gradual structural transformation toward a service-led growth model, consistent with broader national and global trends. Sectors such as real estate, trade, finance, and professional services have driven this shift, and their improved classification and valuation under the revised system (especially with inclusion of services like communication and digital finance) further enhance the precision of sectoral estimates.

In contrast, the primary sector, although foundational for employment and food security, grew at a relatively modest CAGR of 2.92 percent. This lower rate of growth is indicative of persistent structural challenges in agriculture and allied activities. It also explains the declining share of the primary sector in Gross State Value Added (GSVA), a trend more accurately captured under the revised valuation and classification practices that isolate crop, livestock, forestry, and fishing activities in disaggregated formats.

The per capita income at constant prices, which serves as a proxy for individual economic welfare, recorded a CAGR of 5.49 percent during the same period. This suggests moderate but consistent improvement in living standards. The accurate reflection of per capita income under the new series-owing to enhanced data integration from sources like MCA21 and NSS surveys-adds credibility to this finding.

## Findings

1. **Improved Accuracy and Responsiveness of GSDP Estimates**: The base year revision to 2011-12 has resulted in more accurate measurement of economic performance, as seen in the realistic capture of COVID-19's economic shock (-9.0% GSDP growth in 2020-21) and the rapid recovery thereafter (9.7% in 2021-22). This confirms the improved responsiveness of the revised time-series structure.
2. **Structural Transformation is More Visible**: The revised series shows a declining share of the primary sector (from 23.6% to 16.3%) and an increase in the tertiary sector's share (from 44.9% to 50.7%). This shift aligns with theoretical models of economic maturity and is now better reflected due to improved classification and valuation methods.
3. **Sectoral Growth Trends are More Differentiated**: Compound Annual Growth Rates (CAGRs) derived from the revised data show that the tertiary sector is growing fastest at 7.39%, followed by the secondary sector (6.77%) and then the primary sector (2.92%). These growth patterns demonstrate the effectiveness of new methodologies in isolating sector-specific trends.
4. **Per Capita Income Tracking is Aligned with Welfare Measurement**: The per capita income at constant prices has grown at a CAGR of 5.49%, indicating moderate but stable improvement in living standards. The use of updated NSS surveys and better demographic data has improved the welfare-tracking ability of the revised estimates.
5. **Compliance with SNA 2008 Strengthens Statistical Quality**: Haryana's adoption of SNA 2008 standards-including MCA21 database integration, reference rate-based FISIM, and capitalisation of R&D-has made its GDP accounting internationally comparable and methodologically robust.

## Policy Implications

1. **Promote Service Sector as Growth Engine:** Given the strong performance of the tertiary sector, the state should focus on further strengthening services such as finance, logistics, IT, and professional services. Sector-specific incentives and investment facilitation policies can accelerate growth and employment.
2. **Revitalise the Primary Sector through Technological Integration:** The low CAGR in the primary sector indicates stagnation. The government should promote agri-tech, precision farming, and cold-chain logistics to reverse this trend and improve rural income levels.
3. **Institutionalise Real-Time Data Integration:** The success of MCA21 and NSS data usage underlines the need to institutionalize real-time digital data inputs into GDP estimation. Haryana should develop state-level equivalents of MCA21 for MSMEs and informal sector tracking.
4. **Decentralise Economic Monitoring:** Due to the limitation of no district-level data in the current series, policy formulation suffers at the micro level. The state must invest in district GDP tracking mechanisms using satellite data, mobile surveys, and real-time administrative databases.
5. **Use Revised GSDP Estimates for Targeted Fiscal Planning:** The increased credibility of new GSDP and GSVA estimates should now directly inform fiscal budgeting, welfare scheme allocation, and investment prioritization. Sector-wise growth performance can help in outcome-based resource allocation.

## Conclusion

The base year revision to 2011-12 has emerged as a transformative leap in Haryana's economic accounting, bringing clarity, precision, and global comparability to the state's income estimates. It not only modernized the statistical foundation of GSDP and GSVA calculations but also captured the true pulse of Haryana's dynamic economy-be it the impact of the pandemic or the silent rise of the service sector as the state's new growth engine. With more reliable per capita income tracking and sector-specific insights, the revised series empowers policymakers with sharper tools for targeted planning and investment. The story of Haryana's economic journey-its resilience, reform, and structural evolution-is now more vividly and truthfully told through this updated framework. As the state moves ahead, leveraging this main data architecture can unlock smarter governance and more inclusive growth, setting an example for statistical reform across Indian states.

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